
**Information technology — Document
Schema Definition Languages (DSDL) —
Part 8:
Document Semantics Renaming
Language (DSRL)**

*Technologies de l'information — Langages de définition de schéma de
documents (DSDL) —*

*Partie 8: Langage pour renommer une sémantique de documents
(DSRL)*

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 19757-8 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 34, *Document description and processing languages*.

ISO/IEC 19757 consists of the following parts, under the general title *Information technology — Document Schema Definition Languages (DSDL)*:

- Part 1: Overview
- Part 2: Regular-grammar-based validation — RELAX NG
- Part 3: Rule-based validation — Schematron
- Part 4: Namespace-based Validation Dispatching Language (NVDL)
- Part 7: Character Repertoire Description Language (CRDL)
- Part 8: Document Semantics Renaming Language (DSRL)
- Part 9: Namespace and datatype declaration in Document Type Definitions (DTDs)

Introduction

ISO/IEC 19757 defines a set of Document Schema Definition Languages (DSDL) that can be used to specify one or more validation processes performed against Extensible Markup Language (XML) or Standard Generalized Markup Language (SGML) documents. (XML is an application profile of SGML, ISO 8879:1986.)

A document model is an expression of the constraints to be placed on the structure and content of documents to be validated with the model. A number of technologies have been developed through various formal and informal consortia since the development of Document Type Definitions (DTDs) as part of ISO 8879, notably by the World Wide Web Consortium (W3C) and the Organization for the Advancement of Structured Information Standards (OASIS). A number of validation technologies are standardized in DSDL to complement those already available as standards or from industry.

To validate that a structured document conforms to specified constraints in structure and content relieves the potentially many applications acting on the document from having to duplicate the task of confirming that such requirements have been met. Historically, such tasks and expressions have been developed and utilized in isolation, without consideration for how the features and functionality available in other technologies might enhance validation objectives.

The primary objective of ISO/IEC 19757 is to bring together different validation-related tasks and expressions to form a single extensible framework that allows technologies to work in series or in parallel to produce a single or a set of validation results. The extensibility of DSDL accommodates validation technologies not yet designed or specified.

In the past, different design and use criteria have led users to choose different validation technologies for different portions of their information. Bringing together information within a single XML document sometimes prevents existing document models from being used to validate sections of data. By providing an integrated suite of constraint description languages that can be applied to different subsets of a single XML document, ISO/IEC 19757 allows different validation technologies to be integrated under a well-defined validation policy.

ISO/IEC 19757 integrates constraint description technologies into a suite that

- provides user control of names, order and repeatability of information objects (elements),
- allows users to identify restrictions on the co-concurrence of elements and/or element contents,
- allows specific subsets of structured documents to be validated,
- allows restrictions to be placed on the contents of specific elements, including restrictions based on the content of other elements in the same document,
- allows the character set that can be used within specific elements to be managed, based on the application of the ISO/IEC 10646 Universal Multiple-Octet Coded Character Set (UCS),
- allows default values to be assigned to element content and attribute values,
- allows SGML to be used to declare document structure constraints that extend DTDs to include functions such as namespace-controlled validation and datatypes.

Information technology — Document Schema Definition Languages (DSDL) —

Part 8: Document Semantics Renaming Language (DSRL)

1 Scope

This part of ISO/IEC 19757 specifies a mechanism that allows users to assign locally meaningful names to XML elements, attributes, entities and processing instructions, without having to completely rewrite the DTD or schema against which they are to be validated. In addition, this part of ISO/IEC 19757 provides an XML-based format for declaring the replacement text for entity references and provides a mechanism that allows users to define default values for both element content and attribute values.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE Each of the following documents that is not an International Standard has a unique identifier that is used to cite the document in the text. The unique identifier consists of the part of the reference up to the first comma.

IRI, IETF RFC 3987, *Internationalized Resource Identifiers (IRIs)*, Internet Standards Track Specification, January 2005, <http://www.ietf.org/rfc/rfc3987.txt>

ISO/IEC 19757-2:2003, *Information technology — Document Schema Definition Language (DSDL) — Part 2: Regular-grammar-based validation — RELAX NG*

ISO/IEC 19757-2:2003/Amd.1:2006, *Information technology — Document Schema Definition Language (DSDL) — Part 2: Regular-grammar-based validation — RELAX NG — Amendment 1: Compact Syntax*

ISO/IEC 19757-3:2006, *Information technology — Document Schema Definition Languages (DSDL) — Part 3: Rule-based validation — Schematron*

ISO 8879:1986, *Information processing — Text and office systems — Standard Generalized Markup Language (SGML)*

XML, *Extensible Markup Language (XML) 1.0 (Fourth Edition)*, W3C Recommendation, 16 August 2006, <http://www.w3.org/TR/2006/REC-xml-20060816>

XML-Infoset, *XML Information Set (Second Edition)*, W3C Recommendation, 4 February 2004, <http://www.w3.org/TR/2004/REC-xml-infoset-20040204>

XML-Names, *Namespaces in XML 1.0 (Second Edition)*, W3C Recommendation, 16 August 2006, <http://www.w3.org/TR/2006/REC-xml-names-20060816>

XML Schema, *XML Schema Part 1: Structures Second Edition*, W3C Recommendation, 28 October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/>

XSD, *XML Schema Part 2: Datatypes Second Edition*, W3C Recommendation, 28 October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/>

XSLT 2.0, *XSL Transformations (XSLT) Version 2.0*, W3C Recommendation, 23 January 2007, <http://www.w3.org/TR/2007/REC-xslt20-20070123/>

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19757-2, ISO/IEC 19757-3 and the following apply.

3.1 DSRL map
set of rules that is used to map a document instance to a document model defined by one or more schemas

3.2 entity
ISO 8879:1986 general entity that can be referenced using an XML entity reference

3.3 entity node
node in a Document Object Model that identifies an entity and, where appropriate, contains details of its replacement text

3.4 IRI
Internationalized Resource Identifiers as defined in IETF RFC 3987

3.5 SGML
Standard Generalized Markup Language defined in ISO 8879:1986

4 The role of the Document Semantics Renaming Language

The Document Semantics Renaming Language (DSRL) provides a mechanism for declaring how an application can map locally meaningful element, attribute, entity and processing instruction names to the names assigned to equivalent XML elements, attributes, entities and processing instructions within a document model without having to completely rewrite the DTD or schema to which they are required to conform.

In addition, DSRL provides an XML-based format for declaring the replacement text for entity references and provides a mechanism that allows users to define default values for both element content and attribute values. To allow for schemas that do not support the use of attributes, DSRL also allows users to convert attribute values to element content.

4.1 Namespace

Elements and attributes that conform to this Part of DSDL shall have an XML namespace definition (as defined in XML-Names) whose associated resource identifier (IRI) is:

```
http://purl.oclc.org/dsdl/dsrl
```

In this Part the prefix `dsrl:` is used to identify points at which this IRI defines the namespace.

NOTE: In most applications of DSRL this namespace prefix will not be required as the IRI can be assigned as the default XML namespace.

Other namespaces required to group elements and attributes into processable units can be assigned as required for validation.

5 DSRL maps

The outermost element of a DSRL map has the following structure:

```
<dsrl:maps xmlns:dsrl="http://purl.oclc.org/dsdl/dsrl">
  ...
</dsrl:maps>
```

Two optional attributes can be associated with this element:

- `targetNamespace` may be used to record the IRI assigned as the target namespace for the validating schema;
- `targetSchemaLocation` may be used to record the IRI assigned to the schema to be used to validate the mapped document instances.

The `targetNamespace` attribute is required when the schema identified by the `targetSchemaLocation` attribute has a target namespace.

NOTE: The `targetSchemaLocation` attribute can be used to provide a specific location for the schema to be used for the validation of the result document. If there is no requirement to validate both the optional attributes can be omitted. If a null value is present for `targetSchemaLocation` the DTD to be used to validate it is presumed to be part of the document. If a namespace is declared but no schema location is stated the namespace is mapped against an empty string.

The formal declaration for this element, defined using the RELAX NG Compact Syntax, is:

```
namespace xsd="http://www.w3.org/2001/XMLSchema-datatypes"
namespace dsrl="http://purl.oclc.org/dsdl/dsrl"

maps = element dsrl:maps
  {target-namespace?, schema-location?,
   (element-map | attribute-map | map-pi-target )+,
   entity-name-map?, define-entity*
  }
```

```
target-namespace = attribute targetNamespace {xsd:anyURI}
schema-location = attribute targetSchemaLocation {xsd:anyURI}
```

NOTE: Support for the optional `entity-name-map` component is a conformance issue (see Clause 8).

6 Mapping user-defined names to schema-defined names

6.1 Reassigning element and attribute names

The `dsrl:element-map` element is used to record replacements that apply to element names and to their associated attributes. The model for this element is:

```
element-map = element dsrl:element-map (parent?, (name | name-map),
  attribute-map*, default-content?)

parent = element dsrl:parent { text }
name = element dsrl:name { added-attribute*, xsd:QName }
added-attribute = attribute additional { xsd:boolean }
name-map = { (from, to) }
from = element dsrl:from { text }
to = element dsrl:to { text }
```

The contents of a `dsrl:element-map` element consists of a sequence of elements that define which name in a document instance is to be matched to which element in the validation schema, and which attributes of the element are to be mapped. Optionally default content can also be defined for the element.

The name of the element to be mapped is recorded in the content of the `dsrl:from` element. This content shall be a valid XML name, which can include a prefix that identifies the appropriate namespace. If the content is a prefixed

name, it is recommended that the prefix used be declared in a namespace declaration that is declared as an attribute of the `dsrl:from` element.

NOTE: If the namespace is declared within the definition of the `dsrl:from` element you can be certain that the association of the name with the referenced IRI is correctly recorded. This makes it easier to reuse the definition safely, and can make processing easier.

If the named element needs to be replaced in different ways in different contexts the optional `dsrl:parent` element can be used to record XML Stylesheet Language Transformation (XSLT) patterns that distinguish between the different contexts in which replacement of the name is to be applied. No two `dsrl:element-map` elements shall have identical contents for both their `dsrl:parent` element and their `dsrl:from` element. If two or more maps with different contents match the same result path the last of matches shall be applied.

NOTE: This precedence rule allows the XSLT error recovery rule for matching paths using the last template defined to be applied when processing DSRL using XSLT.

The name to be applied to the mapped element when it is validated is recorded as the content of the `dsrl:to` element. This content shall be a valid XML name, which can include a prefix that identifies the appropriate namespace. If the content is a prefixed name, it is recommended that the prefix used be declared in a namespace declaration that is declared as an attribute of the `dsrl:to` element.

If the element name is to stay the same, but one or more attributes of the element is to have its name or values mapped, the `dsrl:name` element can be used in place of the `dsrl:from` and `dsrl:to` pair. The content of a `dsrl:name` element shall be a valid XML name, which can include a prefix that identifies the appropriate namespace.

Names can be qualified providing the relevant namespace prefixes have been declared within the map. They cannot contain spaces, or any other character that is not a valid name character as defined in the W3C XML specification.

The contents of the `dsrl:parent` element shall form a valid XSLT pattern that identifies a permitted parent for the element to be renamed.

NOTE: A typical example of a DSRL element name map for which no attribute mapping is required would be:

```
<dsrl:element-map>
  <dsrl:from>adresse</dsrl:from>
  <dsrl:to>address</dsrl:to>
</dsrl:element-map>
```

If namespaces are used for the source or result element they should be declared as part of the definition, giving the declaration the form:

```
<dsrl:element-map>
  <dsrl:from xmlns:old="http://www.example.org/namespaces/a">old:name</dsrl:from>
  <dsrl:to xmlns:new="http://www.example.org/namespaces/b">new:name</dsrl:to>
</dsrl:element-map>
```

The `dsrl:attribute-map` element is used within `dsrl:element-map` elements to record replacements that apply to attribute names and values. The model for this element is:

```
attribute-map = element dsrl:attribute-map {(name | attribute-name-map),
                                             values-map?, default-value?}
attribute-name-map = (from, (to|to-element))
to-element = element dsrl:to-element { text }
```

Each `dsrl:attribute-map` replaces a single attribute. The name of the attribute to be mapped is recorded as the content of the `dsrl:from` element. No two `dsrl:attribute-map` elements within a given `dsrl:element-map` shall have the same value for their `dsrl:from` element.